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NEWS AND NOTES

Dr. W. A. Murrill, who left New York, October 13, for a collecting trip in Washington, Oregon, and California, reports very favorable conditions for the collection of fleshy fungi on the Pacific coast.

Dr. Mel. T. Cook has recently resigned his position as pathologist in Delaware Agricultural College to accept a similar position in Rutgers College, New Jersey.

Mr. A. B. Stout, of the University of Wisconsin, has been appointed director of the laboratories in the New York Botanical Garden to succeed Mr. Fred J. Seaver, who has been transferred to a curatorship.

Professor R. A. Harper is conducting a series of seminars for the benefit of the graduate students of Columbia University, the subject considered being the reproduction of the higher fungi. The first of the series, which was held in the main laboratory of the New York Botanical Garden, Saturday, November 4, consisted of an introduction covering some of the earliest literature of the subject.

Professor J. C. Arthur and Dr. Frank D. Kern spent a month during the past summer on a field trip in Colorado. They were chiefly interested in observing and collecting the rusts, especially those heteroecious forms of which the life-histories are still unknown. They report that the trip was very successful and satisfactory. They were accompanied on several expeditions by Professor E. Bethel, of the East Denver High School, who rendered much valuable assistance.

A New Paint-destroying Fungus.—Mr. George Massee in the

Bulletin of Miscellaneous Information of the Royal Botanic Gardens, Kew, England, No. 8 of this year, describes a new fungus (*Phoma pigmentivora* Mass.) which grows on fresh paint. The fungus grows best in hothouses, high temperatures and constant humidity being especially conducive to its development.

The fungus appears as numerous, small, rose-colored specks in the white paint about a month after it has been applied. These spots increase in size and change to a purple or dark-red color suggesting the idea of blood having been sprinkled on the paint. The discolored areas spread and finally form effused patches several inches in diameter. The fruit of the fungus appears as minute blackish-red warts. One firm of painters during the present year lost over £200 in consequence of the appearance of the fungus in a large number of cucumber-houses painted with expensive protective paint.

The spores germinate in pure linseed oil but the mycelium remains colorless and produces no fruit. No germination takes place when the spores are sown in pure white lead. The red color suggests that the white carbonate of lead undergoes some chemical change induced by the presence of the fungus resulting in the formation of oxide of lead. The presence of two per cent. of carbolic acid in paint completely arrests the development of the fungus.

This is another illustration of the growth of certain fungi under conditions which would naturally be thought to be toxic to any living plant.—*F. J. Seaver.*

The Development of the Ascocarp of Lachnea scutellata.—In the Botanical Gazette for October; Dr. W. H. Brown gives the results of his studies of the development of the above named species, a common and widely distributed discomycete occurring on rotten wood.

The multinucleate ascogonium was found in the youngest plants which could be obtained to constitute the penultimate cell of the archicarp which when mature consists of about nine cells. No antheridium was found and it is probable that none was present. No fusion of nuclei was observed in the ascogonium or in the ascogenous hyphae except in the tip where the nuclei fuse to form the primary nucleus of the ascus. The ascogenous hyphae grow out from the ascogonium and are multinucleate from the first. The tips of the smaller branches of the ascogenous hyphae are cut off and contain two nuclei. No uninucleate cells were observed. The two nuclei pass into the bent portion and divide. Walls are formed between the daughter nuclei thus forming a binucleate penultimate and uninucleate ultimate and antipenultimate cell which represents a typical hook. The penultimate cell gives rise to an ascus direct or divides to form other hooks.

The first division in the ascus is heterotypic and the second and third are similar to those in the ascogonium.—*F. J. Seaver.*

A Preliminary Report on the Yearly Origin and Dissemination of Puccinia graminis.—A paper by Mr. Fred J. Pritchard under the above title in the Botanical Gazette for September contains the record of the observations of the author of the paper for several years past, together with the results of recent experimental work on the germination of rusted wheat grains.

The absence of the barberry in several regions where *Puccinia graminis* is prevalent seems to indicate that the heteroecism of the fungus is merely facultative. While the existence of a perennial mycelium has been established for several of the rusts this has not been proven for *Puccinia graminis.*

Eriksson after extensive experiments in Sweden divides *Puccinia graminis* into several biological forms. His conclusions however have not been supported by Carleton's work in America.

The experiments of Pritchard show that *Puccinia graminis* passes readily from wheat, *Agropyron tenerum, A. repens, Hordeum jubatum* and *Elymus triticoides* to the barberry. His observations also seem to indicate that the aeciospores and uredospores are not carried to great distances by the wind.

The pericarp of rusted wheat grains is frequently filled with rust mycelium and pustules of teleutospores. Pieces of mycelium resembling rust were found in cells of the scutellum close to the growing plant. It is suggested as a possibility that the mycelium of the rust might in this way infect the young plant and later take on a virulent form.—*F. J. Seaver.*

Studies on the Tremellineae of Wisconsin.—In his studies of the Tremellineae of Wisconsin in the transactions of the Wisconsin Academy of Sciences, Arts and Letters, volume 16, part 2, E. M. Gilbert has brought together the species of the order from that state in such a way as to be of valuable service to the student of mycology and to the monographer of the group. He has included the descriptions of fifteen species, quoting the commonly accepted synonyms. He finds in addition species in *Tachaphantium, Tremella* and *Dacryomyces* which he thinks may be new and possibly new varieties of *Auricularia auricula, Dacryomyces deliquescens* and *Calocera cornea.* His conservatism in that he has refrained from giving them new names without further investigation is commendable.

Naematelia encephala which he states has not been reported before for this country was frequently collected by Mr. Ellis and was distributed by him in North American Fungi *1719.* Also *Naematelia nucleata* which according to Gilbert has apparently not before been reported from this country was issued by Mr. Ellis in North American Fungi *520.*

A more extended study of exsiccati would have enabled him to suggest additions to the synonymy of several species, as his account probably covers most of the species ordinarily found in the country.—*B. O. Dodge.*

A Biologic and Taxonomic Study of the Genus Gymnosporangium.—Volume 7, No. 26, of the Bulletin of the New York Botanical Garden, issued October 12, was entirely devoted to a paper under the above title by Dr. F. D. Kern, associate botanist in Purdue University Agricultural Experiment Station, Lafayette, Indiana. This subject is treated in two parts, the first being devoted to the biology of the genus and the second to its taxonomy.

Under the subject of the biology of the genus the life history of *Gymnosporangium* as compared with other rust genera, the general characters of the genus, nuclear history so far as it is known, and facts governing the distribution of the species are considered briefly. Under experimental investigation the author gives a brief account of the history of experimental work and the discovery of heteroecism; he also discusses culture methods and the necessity for such work and then takes up an account of his own experimental work. This work was preceded by five seasons of culture work with the various species of the genus. Out of 33 species now recognized in their telial phases 26 have been available for culture work. Successful cultures were secured in 18 out of the 26 species tested. Of these 9 were verifications of life cycles previously known and 9 gave aecial and telial connections for the first time. During the course of the work 253 individual plant cultures were attempted and 25 species of trial hosts employed, belonging chiefly to the apple family. The pathologic and economic importance of the genus is considered at the close of the first part of the work.

In the taxonomic study of the genus the author prefers to retain the well-known name *Gymnosporangium* rather than to adopt the older name *Aecidium* which has come to be used strictly as a form-genus. The paper contains descriptions of 29 species which have full life cycles known, 4 known only in the telial phase and 7 known only in the aecial phase; a total of 40 species in all. Of these 4 represent new species and 9 are new combinations. The descriptions are preceded by two analytic keys, the one based on the aecia and the other on the telia. There are also two host keys, the first being a key to the hosts harboring the aecial phase and the second a key to the hosts harboring the telial phase.

The entire paper consists of 89 pages of text, 11 half-tone plates and 36 figures.—*F. J. Seaver.*

The Control of the Chestnut Bark Disease.—Haven Metcalf and J. F. Collins treat the subject in farmers bulletin No. 467, issued by the United States Department of Agriculture, October 28, 1911.

The total financial loss from this disease is now estimated at $25,000,000. The only known practical means of controlling the disease in a forest is to locate and destroy the advance infections as soon as they appear. Advance infections should be located by trained observers and destroyed by cutting and burning. Chestnut nursery stock should be rigidly inspected and only perfectly healthy plants passed. The life of valuable ornamental trees may be greatly prolonged by promptly cutting out all diseased parts and covering cuts with tar. Spraying is of no use in stopping the fungus after it is once started. Diseased chestnut trees should be cut down and utilized as soon as possible. For the present the planting of chestnuts anywhere east of Ohio is not advised, but there is no apparent reason why chestnut orchards west of Ohio cannot be kept free from the disease.—*F. J. Seaver.*

The Blister Rust of White Pine.—Bulletin 206 of the Bureau of Plant Industry of the United States Department of Agriculture contains the results of the investigation of this disease by Mr. Perley Spaulding. The growth of the reforestation movement in America has caused a steady increase in the importation of young white pine stock, with the consequent danger of introducing destructive insect or fungus pests.

Cronartium ribicola, which was discovered in 1855, was later found to be only a stage of *Peridermium Strobi,* the blister rust of various species of *Pinus.* This fungus has been introduced from Europe into numerous localities in America.

The methods of preventing and combating this disease are as follows: stop importing five-leaved pines (for which the fungus has a preference) and *Ribes* (which constitutes the alternate host for this fungus) and raise these plants at home; keep five-leaved pines separated from *Ribes* if either is imported; where the disease is already present all diseased pines should be removed and burned; diseased *Ribes* bushes should also be removed and burned.

Rigid inspection of all imported stock, or the entire prohibition of the importation of five-leaved pines and *Ribes,* should be compelled by legislation.—*F. J. Seaver.*

The Relation of Parasitic Fungi to the Contents of the Cells of the Host Plants (I. The Toxicity of Tannin).—The above is the title of an extensive paper by Dr. M. T. Cook and Mr. J. J. Taubenhaus published as Bulletin No. 91 of the Delaware College Agriculture Experiment Station. The resistance of certain plants to the attack of disease-producing fungi has been often observed and discussed. It has been accounted for first by certain structural characters or impervious leaf surfaces and then by the assumption of a peculiar resistant type of cell due to physiological and consequently chemical differences *within* the cell. Now, the first of these explanations was early disproved by the researches of Ward and others while the idea of physiological resistance has not been investigated as much as its importance would seem to make desirable. Dr. Cook attacked this problem with the idea of discovering, if possible, to what extent the substance *tannin,* of almost universal occurrence among plants, may function in their immunity against fungous diseases. Later it is intended to extend the investigation to include the other cell constituents having a possible bearing upon such immunity.

The methods of study were well planned and carefully carried out. It consisted, briefly, in inoculating different types of culture media, containing varying amounts of tannin, with a large number of parasitic and saprophytic fungi known to produce plant disease. In general it was found that tannin inhibited the growth of the fungi and that this effect was more pronounced in the case of the parasites than with the saprophytes. Small amounts of tannin seemed to have a stimulative action upon growth and fruiting but usually from 0.1 per cent. to 0.4 per cent. tannin had a strong inhibitory effect. It was thought that the acidity of the tannin might account for its observed action upon the fungi but upon experimentation it appeared that even after neutralization with sodium hydroxide the tannic acid radicle still showed its characteristic inhibitions to a large extent. Different amounts of sugars and protein in the media had very little effect in reducing the toxicity of tannin.

The action of tannin upon the germination of the spores was found to be unfavorable if it were present in anything more than slight amounts. In toxic percentages the time necessary for germination was considerably increased. On the other hand, in smaller amounts tannin acted as a stimulant of germination. Some interesting tests were performed by placing cultures of certain fungi upon very thin cork sheets which had been treated to remove all the tannin. After a certain time all of the fungi made their way through the cork films and infected the agar below. However, if such cork sheets were allowed to absorb tannin solutions and were then inoculated as before, the fungi were not able to penetrate the cork at all. It might be added that it was early observed that commercial tannin is slightly more toxic than the fresh extract of oak bark. All of these facts taken with the observations of others led the authors to believe that the presence of tannin in the host cells may often help to produce an immunity from the attacks of fungi.—*E. D. Clark.*